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Date: Dec 3, 2003 Signed: Joanne H. Siebert

By: Joanne H. Siebert

JOHN C. PARKS, ET AL.

SERIAL NO.: 09/888,246

FILED: JUNE 22, 2001

FOR: IMPROVED BROMINATION PROCESS

ART UNIT: 1616

EXAMINER: BADIO, B.

Attny. Docket No.: FR-6842-C
Customer No.: 2071

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313

Sir:

BRIEF ON APPEAL

This is an appeal from the Final Rejection dated June 4, 2003. This Brief is submitted in triplicate, along with the enclosed requisite petition for extension of time and deposit account charge authorization for the necessary fees.

1) Real Party in Interest

The real party in interest for this appeal is Albemarle Corporation, a Virginia corporation having a place of business at 451 Florida Street, Baton Rouge, Louisiana 70801.

2) Related Appeals and Interferences

A prior parent U.S. Application No. 08/658,983, filed on June 4, 1996, previously was on appeal before this Board. In that prior appeal, this Board reversed the present Examiner's rejection

of the prior related application, and the application ultimately issued as U.S. Patent 6,518,468 B1. There are believed to be no other related appeals or interferences.

3) Status of Claims

This application is a continuation of prior co-pending Application No. 08/658,983, filed June 4, 1996, now U.S. Patent 6,518,468 B1, which in turn was a continuation of prior co-pending Application No. 08/338,711, filed November 14, 1994, now abandoned, which in turn was a continuation-in-part of prior co-pending Application No. 08/317,792, filed September 16, 1994, now abandoned.

Claims 1, 2 and 4 are in the case, and all have been rejected. This appeal is directed to each of Claims 1, 2 and 4. The Examiner finally rejected these claims in the Final Rejection mailed June 4, 2003, and the Notice of Appeal was thereafter filed on September 3, 2003, and received at the U.S. Patent and Trademark Office on September 8, 2003. Claims 1, 2 and 4 as they now stand are reproduced in the APPENDIX attached hereto.

4) Status of Amendments Subsequent to Final Rejection

No amendments were submitted subsequent to Final Rejection.

5) Summary of the Invention

The presently claimed invention is directed to a unique wet cake comprising water and a solid brominated diphenylethane product, which product contains a predominate amount of decabromodiphenylethane, the wet cake having an occluded free bromine content of from about 500 ppm to about 2000 ppm. The dependent claims in this case are directed to similar subject matter, wherein the occluded free bromine content falls within narrower ranges. This wet cake composition is considered to be easily converted to a high-quality ready-to-use flame-retardant product characterized by having a lower occluded bromine content than that which is obtainable by prior processes. See, e.g., Specification at paragraph 0005. The wet cake is typically derived from a separation step in the process of producing the flame retardant decabromodiphenylethane. See, e.g., Specification paragraphs 0041-0044. The favorable occluded free bromine content level of the

claimed wet cake as compared to that of prior wet cakes was illustrated at least in the Comparative Runs set forth in the Specification.

6) Issues

Is the Examiner's rejection of Claims 1, 2 and 4 under 35 U.S.C. 103(a) on Mack et al. (U.S. Patent 5,457,248) proper under the law and facts of this case?

7) Grouping of Claims

Although each claim on appeal is deemed patentable in its own right, to facilitate the Appeal, and for purposes of this Appeal only, all of the claims in this case are grouped together.

8) Argument

(A) The Examiner has failed to meet her burden of establishing a prima facie case of obviousness under 35 U.S.C. § 103(a) because the sole cited reference does not teach or suggest the claimed invention.

The sole rejection in the case is the rejection under 35 U.S.C. § 103(a) on Mack *et al.* U.S. 5,457,248 (Mack). To make out a *prima facie* case of obviousness, th Examiner has the burden of showing some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d1780, 1783 (Fed. Cir. 1992). Second, there must be a reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claim limitations. *In re Bell*, 991 F.2d 781, 782, 26 USPQ2d 1529, 1531 (Fed.Cir.1993). The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Geiger*, 815 F.2d 686, 2 U.S.P.Q.2d 1276 (Fed. Cir. 1987). Moreover, the inherent disclosures of a reference, if any, cannot be used to support a *prima facie* case of obviousness under section 103(a), since that which is not known at the time of the invention (i.e., only is inherent) cannot form a proper basis for an obviousness rejection. See *In re Shetly*, 195 U.S.P.Q. 753, 756-57 (CCPA 1977); *In re Spormann*, 150 U.S.P.Q. 449, 452 (CCPA 1996); *In re Pijckaert*, 28 U.S.P.Q.2d 1955,

1957 (Fed. Cir. 1993). Even for inherency under section 102, a *prima facie* case of anticipation requires that allegedly inherent result necessarily, inevitably and always occur. See, *e.g.*, *MEHL/Biophile Intern. Corp. v. Milgraum*, 192 F.3d 1362, 1365, 52 U.S.P.Q.2d 1303, 1306 (Fed. Cir. 1999).

In the present case, the Examiner's primary basis for rejection appears to be summarized in Page 2 of the Final Rejection, where she states the following:

> If the color of the wet cake evidences its occluded free bromine content as disclosed by the present specification (see page 14, line 1) and Mack teaches improvement in the color of the brominated product by treatment with hot water and a chelating or complexing agent (see col. 5, lines 9-37, especially Examples 2-4), one of ordinary skill in the art would have the reasonable expectation that the prior art wet cake treated as taught by Mack would have *low amounts* of occluded free bromine content even though the amount is not disclosed by the reference.
>
> (Emphasis added.)

First it is interesting to note from this passage that the Examiner improperly relies upon the Applicants' own teachings regarding a relationship between color and occluded free bromine content to support this obviousness rejection. More importantly, however, the emphasis in the quoted text above helps to focus upon the flaw in the Examiner's logic in her attempt to establish some reasonable expectation of success, for it reveals the Examiner's use of the Mack disclosure regarding the color of the Mack *end product* (a dried and oven-aged product) to suggest that the Mack *wet cake* realizes an improvement in color, when in fact there is nothing in Mack which reveals any actual color improvement for the Mack wet cake, much less something which suggests what a "low amount" of occluded free bromine content in a wet cake might mean. The only favorable color results disclosed in Mack were those color indications for the Mack end product. To extrapolate from that disclose some color improvement to the Mack wet cake on an order of magnitude comparable to the present invention is to ignore the fact that every favorable color indication in Mack was with respect to a dried, oven-aged product, or a product which underwent high temperature treatment with aromatic solvent and recrystallization.

No *prima facie* case of obviousness exists here, or can exist here, because Mack itself shows that, if by chance one of ordinary skill in the art were to consider the matter of occluded free bromine in the Mack water-based filter cakes despite the lack of any express reference to the subject in the reference, the artisan could not conclude from the Mack disclosure that such filter cakes would have "low" occluded free bromine levels. Indeed, in this hypothetical situation such artisan would be led by the Mack teachings and results to the conclusion that the occluded free bromine in such Mack filter cakes would necessarily be "high."

In particular, Example 1 of Mack produces a wet cake from a water slurry which has been stripped of bromine by pumping the brominated reaction mixture into water at 99°C "to remove the bromine" (Column 11, lines 34-37). This is the preferred procedure described by Mack at Column 5, lines 11-16. In Mack Example 1, the slurry was then filtered to produce a wet cake which, after washing with water and drying in an oven at 120°C to constant weight, gave a tan solid. This solid is shown to have a very high Yellowness Index of 73.4. Clearly, the solids would thus be considered to contain a substantial quantity of occluded free bromine, even though Mack *et al* may not have appreciated this. In any event, the reference is in fact completely devoid of any express teachings concerning occluded free bromine in wet cakes from aqueous systems.

In sharp contrast, in accordance with Applicants' Example 1, the bromination product after bromine stripping in hot water at about 58°C and treatment in water with a base and a small amount of surfactant, formed a wet cake as claimed comprising water and solid brominated diphenylethane product containing a predominate amount of decabromodiphenylethane, which wet cake after drying in an oven at 205°C for *2 seconds* gave a product which had, prior to oven aging, Yellowness Indexes within the range of about 12.5 to about 17.5. Thus, on a conservative basis, Applicants provide in Example 1 a wet cake which before oven aging had a Yellowness Index that was *over 75% less than that of Mack Example 1.*

The Examiner's reference to Mack Examples 2-4 to support the Final Rejection is of no avail as the Mack reference itself shows. In Mack Examples 2-4 the bromination product was again pumped into hot water which this time contained treating agents glycolic acid, sodium gluconate, or EDTA, which are metal chelating agents or complexes which were not used in any of Applicants Examples, and which according to Mack at Column 5, lines 20-30 improve the color characteristics of brominated diphenylalkanes. Yet, even after roasting the resultant product at 200°C for *30 minutes*, the end product (not the wet cake) had Yellowness Indexes ranging from 14.8 to 16.1.

Therefore Applicants' wet cake after drying but **prior to oven aging** gave samples having Yellowness Index ratings of about 12.5 to about 17.5 whereas the dried and **oven roasted products of Mack** -- not dried samples from a wet cake -- gave Yellowness Index values in the same range. Moreover, in achieving an oven roasted product that had Yellowness Indexes in this range, the Mack reference utilized prior treatments with a chelating or complexing agent, neither of which was used by Applicants when forming the claimed compositions. And even so, it is clear from Mack Examples 2-4 that the Mack wet cake had to have had a higher Yellowness Index before the 200°C roasting for 30 minutes. Such roasting clearly would remove occluded free bromine from the product sample, even though Mack et al may not have appreciated this, and provide no express teachings about occluded free bromine in wet cakes from aqueous systems. Thus there is no reasonable expectation that the treatment in Mack Examples 2-4 would give *wet cakes* having low amounts of occluded free bromine content. Indeed, there is every reason for one skilled in the art to have concluded that whatever the occluded free bromine content may have been, the occluded free bromine content of the Mack wet cake was clearly well above the value in the final product after roasting at 200°C for 30 minutes. Accordingly, one of the major premises of the Final Rejection is seen to be refuted by the very reference upon which it is predicated.

The foregoing is further supported by Mack Example 5, wherein the bromination product was pumped into water at 99°C which contained sodium gluconate complexing agent. After filtering and washing the filter cake with water and oven drying for 14 hours at 120°C, the filter cake yielded a sample having a yellowness index of 45 which again is much higher than the results shown by Applicants for their wet cakes. Here again, if by chance the artisan of ordinary skill in the art were to consider the question of occluded free bromine in the Mack wet cake (despite the complete absence of any express teachings concerning this issue in the Mack patent), the only sensible conclusion possible from this result is that the Mack wet cake had a high content of occluded free bromine. This result when compared with Mack Examples 2-4 would clearly indicate to the above artisan that the roasting at 200°C for 30 minutes in Mack Examples 2-4 was responsible for achieving a significantly lower Yellowness Index in the product (not the wet cake).

Thus, the Mack reference itself provides convincing evidence that if one were to consider the question of occluded free bromine content in the Mack filter cakes -- a most unlikely situation in view of the absence of any express teachings in Mack about occluded free bromine in a water-wet filter cake, and the emphasis placed in Mack on the downstream treatment of the product at high temperature in an aromatic solvent to improve yellowness index -- the inescapable conclusion would have to be that the occluded free bromine content of the water-wet Mack wet cakes would be high, because dried, unroasted samples of such wet cakes gave yellowness indexes of 73.4 (Example 1), and 45 (Example 5), and "a tan solid" (Example 8 at line 52). Accordingly, there simply is no basis in Mack to support the Final Rejection.

(B) The Examiner has applied an inapplicable standard in an attempt to meet her burden under 35 U.S.C. § 103(a).

A further error in the Final Rejection, page 3, is the conclusory assertion that "distilling off various amounts of excess bromine by the prior art process resulting in the formation of wet cakes having different amounts of occluded bromine *would be well within the level of skill of the ordinary artisan.*" (Emphasis added.) This assertion has

no bearing on an obviousness analysis, for it proffers an improper standard for determining obviousness under 35 U.S.C. § 103(a). As this Board stated in *Ex parte Levengood,* 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993):

> At best, the Examiner's comments regarding obviousness amount to an assertion that one of ordinary skill in the relevant art would have been able to arrive at appellant's invention because he had the necessary skills to carry out the requisite process steps. This is an inappropriate standard for obviousness . . . That which is within the capabilities of one skilled in the art is not synonymous with obviousness . . .

Any reliance upon this improper standard to support this rejection should be rejected by the Board.

(C) The Examiner has failed to establish that Mack provides any motivation to modify the teachings for which it is cited in support of the rejection under 35 U.S.C. 103(a).

In addition to all of the foregoing, a close reading of Mack reveals that there is no motivation in Mack to make *any* changes in the technology therein described. As the reference itself makes clear e.g., at Column 5, line 56 to Column 6, line 6, the treatment of the products by dissolving them in an aromatic solvent at high temperature is capable of providing brominated diphenylalkane products having Yellowness Indexes in the range of about 1 to about 8, with Yellowness Indexes in the very low range of about 1 to about 5 being readily obtained. In view of this teaching there is clearly no incentive or motivation in Mack for one skilled in the art to look back to the Mack water-wet wet cake stage as a place to look for improvements in Yellowness Index, muchless reductions in occluded free bromine.

MPEP §2142 advises as follows regarding what is required before the Examiner can establish *prima facie* obviousness:

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach

or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure.

Taking these three requirements one at a time:

1) It is deemed clear from the above that there is no suggestion or motivation, either in the Mack reference itself or in the knowledge generally available to one of ordinary skill in the art, to modify the Mack reference with respect to wet cakes as here claimed. Indeed, and as made manifestly clear herein, if one were to even consider the matter of quality of the water-containing wet cakes of Mack -- despite the lack of any apparent interest, concern or express teaching regarding the same in Mack -- the reference itself would lead to the inescapable conclusion that the water-wet cakes of Mack must have high occluded free bromine contents because of their high yellowness indexes as shown *by Mack itself.*

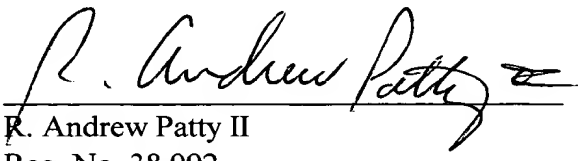
2) Since there is no suggestion or motivation to modify Mack in a direction leading toward Applicants' claimed wet cakes containing water, and since a reading of Mack does not lead to making any modification of the water-wet wet cakes of Mack in view of the high temperature treatment in aromatic solvents described by Mack, there is no modification about which one might have any reasonable expectation of success.

3) Because there is no teaching or suggestion in Mack to make such claimed modification and there is no such modification in Mack about which a reasonable expectation of success could apply, both of these features are absent from the reference and can only have been based on Applicants' disclosure.

9) Conclusion and Relief Sought

For all of the foregoing reasons, the Final Rejection is erroneous and insupportable. The grounds provided in support of the Final Rejection fail to establish a *prima facie* case of obviousness. The Final Rejection should be reversed and all of the present claims should be allowed.

Respectfully submitted,



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APPENDIX - CLAIMS ON APPEAL

1. A wet cake comprising water and a solid brominated diphenylethane product, which product contains a predominate amount of decabromodiphenylethane, the wet cake having an occluded free bromine content of from about 500 ppm to about 2000 ppm.

2. A wet cake according to Claim 1 wherein said bromine content is from about 900 ppm to about 1200 ppm.

4. A wet cake according to Claim 1 wherein said bromine content is from 838 ppm to 1308 ppm.